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ABSTRACT

Several years ago a group of researchers at the Stanford Research and Development Center conducted an investigation exploring team organization in elementary schools and its consequences for individual autonomy, collective control of the work setting, and job satisfaction. The findings of that study, known as the Meyer and Cohen study, were sufficiently challenging, and in certain respects surprising, to warrant intensive, longitudinal investigation. During the longitudinal study, the MITT Project (Management Implications of Team Teaching), it was possible to use the initial data returns to attempt to replicate the original Meyer and Cohen study without waiting for the through-time results. Some important causal relationships suggested by the original study were confirmed, notably that extensive work collaboration curtailed the individual teacher's sense of control over his/her own work. The most significant discrepancy to arise from the replication effort was an indication that unitization was a multidimensional rather than undimensional variable. Work collaboration did not operate alone to effect an alteration in teacher attitudes. (JMF)

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IMPACT OF UNITIZATION ON THE BEHAVIOR AND ATTITUDES OF TEACHERS: A CROSS-SECTIONAL REPLICATION OF THE MEYER AND COHEN STUDY

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IMPACT OF UNITIZATION ON THE BEHAVIOR AND ATTITUDES OF TEACHERS: A CROSS-SECTIONAL REPLICATION OF THE MEYER AND COHEN STUDY*

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Studies in the sociology of organizations suggest that workers experience a sense of dignity, self-worth, and satisfaction when they feel they have some control over their own work conditions. When the organization restricts the physical boundaries, limits the responsibilities, and specifically details the process by which the product is achieved, sense of worker control is likely to be reduced. Amelioration of these alienating conditions of work is sometimes sought through strategies of participatory decision making, job enlargement, power equalization, and the like.

A contemporary innovation in American schools--the formation of the instructional staff into small, closely collaborative teaching teams--is especially illuminating with respect to the control of work conditions and its effect on teacher sentiments. The conventional organization of the teaching process affords individual teachers a high degree of autonomy within the work setting. The teaching task is neither specifically detailed for teachers nor closely supervised. Under the conventional work arrangement, teachers have broad latitude for determining their own methods of work, scheduling of daily routines, and defining the specific ends they seek through their teaching.

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In principle, at least, abandonment of the self-contained classroom in favor of intimately collaborative teaching units poses a threat to autonomy in work.

At the same time, teachers in the standard scheme of school governance have little control either individually or collectively for establishing the boundaries of their work setting. Basic decisions regarding curriculum, staff and student assignment, and resource allocation to special programs in the school typically are made without significant input from the teacher group. With the formal establishment of teaching teams, however, the responsibility for determining the boundary conditions is transferred in whole or in part to faculty units, creating a circumstance in which those most immediately affected by decisions play a part in making them.

Thus, the introduction of team teaching could be expected to have mixed consequences for teachers in a school, on the one hand enhancing their collective control over the general outlines of the work setting but, on the other, reducing the autonomy of each teacher individually in carrying out the instructional process.

Several years ago a group of researchers at the Stanford R & D Center conducted an investigation exploring the issue of team organization in elementary schools and its consequences for individual autonomy, collective control of the work setting, and job satisfaction (Meyer and Cohen, 1971). The findings of that study (hereafter referred to as the Meyer and Cohen study) were sufficiently challenging and in certain respects surprising to warrant intensive, longitudinal investigation. It gave rise to the MITT Project. A happenstance during the selection of schools for the MITT investigation, however, has made it possible to use the initial data returns to attempt to rep-

licate the original Meyer and Cohen study without waiting for the through-time results. This paper will report our replication effort. First, though, we must describe the Meyer and Cohen study more fully.

The Meyer and Cohen Study

The Stanford investigators used a comparative design. They selected 17 elementary schools in the San Francisco Bay Area that were, in their words, organized into "formal work teams to plan cooperatively and to conduct instructional tasks in open instructional areas where teacher situations are not separated by floor-to-ceiling partitions" and another eight schools in which teachers were formally organized "to carry out instructional tasks individually and separately in self-contained classrooms." They referred to the former as open schools and the latter as self-contained schools. At the time of the study, the open schools had been so organized for more than a year but not more than four years.

Questionnaires were distributed to the faculties of the schools to measure a variety of sentiments and attributes of the teaching situation, of which the most salient for the present study are the following.

1. Task-related interaction. Teachers were asked to report the frequency with which they discussed six classroom-related topics with other teachers in group settings. Responses were summed over the six topics to yield an Index of Group Interaction.

2. Teacher group influence. Another set of questions asked teachers to indicate the amount of influence of school committees, teams, or groups on student grading practices, curriculum planning, administration of school rules and regulations, teaching specific lessons or classes, and student con-

trol and discipline practices. Response alternatives ranged from "a great deal" to none, and again teacher responses were summed for an Index of Teacher Group Influence within the School.

3. Autonomy. The Index of Individual Autonomy was based on a set of items worded in this way: "How much influence do you have over your own administration of school rules and regulations, student grading practices, curriculum planning, teaching specific lessons or classes, and student control and discipline practices?" Response alternatives were the same as for the teacher group influence questions.

4. Job satisfaction. This variable was tapped by five questions about the present work situation and about satisfaction with the teaching career.

Responses were obtained from 110 teachers in open schools and 120 in self-contained schools. Meyer and Cohen followed the practice of trichotomizing score distributions for each variable, treating the data categorically, and reporting results through tabulations and cross-tabulations.

Comparing the two types of school, Meyer and Cohen found that teachers in the open-space, team-organized schools did, indeed, impute greater control over the work setting to teacher groups than those in the self-contained schools. Surprisingly, however, the team teaching condition did not seem to restrict the autonomy of individual teachers. Greater autonomy was found among teachers of open than self-contained schools. Thus, the expected mixed effect of team teaching did not materialize in these simple comparisons of schools.

Below we show the association of school type (open vs. self-contained) and the four measured variables in terms of symmetical Lambda's which we calculated from the Meyer and Cohen tables to facilitiate comparison with the MITT replication. The Lambda's reflect the strength of association between categorical variables much as a correlation does in the case of continuous variables.

	Lambda
Task-related interaction	+.32
Teacher group influence	+.25
Individual autonomy	+.07
Job satisfaction	+.10

Plus signs indicate that higher values on the variables are associated with open rather than self-contained schools.

The values show that teachers in open schools interacted more frequently with fellow teachers on classroom-related matters and had higher job satisfaction than their peers in the self-contained schools.

The investigators had in mind a causal ordering of the key variables of their study and reported a number of cross-tabulations that examined interdependencies in keeping with the causal flow. Their causal arrangement is suggested in Figure 1. They viewed task-related interaction as indicative of closely collaborative work relations among teachers--a proxy for functioning instructional teams--and saw teacher group influence and individual autonomy affected by the extent of this interaction. Job satisfaction was presumed to be a product of collegial influence and autonomy.

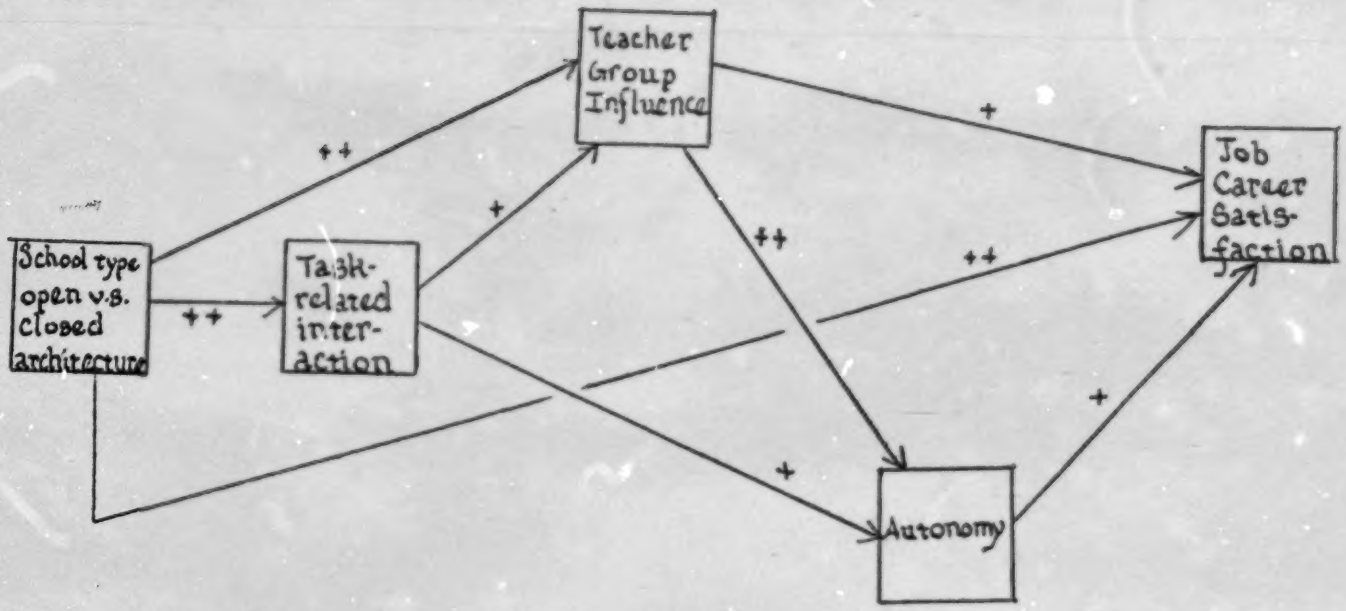

Figure 1: Meyer and Cohen causal model

The results of their cross-tabulations of selected variables were largely, but not entirely, congruent with expectations. They found that the extensity of teacher collaboration in the work setting contributed to the amount of control the teacher group exercised over school affairs and that both autonomy and group influence contributed independently, albeit modestly, to satisfaction on the job. Findings with respect to autonomy, however, remained puzzling. Specifically, they showed that close work collaboration heightened the individual autonomy of teachers rather than reducing it. The relationship was not strong, but it was in a positive direction. The principal determinant of autonomy was the level of influence teachers attributed to the teacher group. Thus, autonomy seemed to be affected exclusively by the control of teachers collectively over the boundaries of the work setting.

Some of the tabulations indicated that the effects of open schools on other variables were not mediated by the extensity of work collaboration. Specifically, school type contributed directly to the level of teacher group influence independently of the level of task-related interaction among teachers. In addition, job satisfaction remained higher among teachers in open than in self-contained schools regardless of the level of teacher group influence or individual autonomy. In one analysis, incidentally, Meyer and Cohen reported that the greater job satisfaction of open school teachers occurred only among those in leadership roles--the more experienced teachers; job satisfaction was no greater among the young teachers than among their counterparts in self-contained schools. In any event, the residual effects of school type suggests the presence of variables and processes distinguishing open and self-contained schools which are not represented in the conceptual model.

We have included in Figure 1 arrows indicating the presence of relationships and plus signs representing the strength of relationships, as given by Meyer and Cohen (1971, p. 89), to summarize their principal findings. It must be borne in mind that the investigators, by virtue of their mode of analysis, were able to control one, or at best two, variables at a time in exploring the interdependencies in the model.

As we considered the possibility of replication with data from the MITT study, Meyer and Cohen's mode of summarizing the findings suggested the utility of employing the method of path analysis. Path analysis allows one to determine whether or not the observed pattern of intercorrelations among a set of variables is consistent with a particular theoretical formulation of causal relations, such as that depicted in Figure 1. Furthermore, the multiple regression techniques of path analysis are especially suited to the problem of examining the effects of one variable on another while controlling for the influence of a reasonably large number of other variables simultaneously. Fortunately, the sample size and measurements from the MITT data were appropriate to the use of such an approach, a matter to which we next turn.

The Replication

For the replication analysis we used data from certain of the 43 elementary schools that were part of the original MITT sample. The longitudinal design of the MITT study called for "before" and "after" measures in a set of schools which, in the interim, had changed from a conventional to a unit organization of the instructional staff. (Unit organization corresponds closely to Meyer and Cohen's conception of the organization of teachers into

"formal work teams," one characteristic of their open schools.) After the schools had been selected and the "before" data obtained, in the spring of 1974, it turned out that seven of the schools already were organized into teaching units and, in some cases, had been so organized for two or three years. While the seven schools were not appropriate to a before-after design, they afforded an opportunity to replicate the comparative study of the Stanford researchers. Comparisons could be made between teachers in the unitized schools and those in 13 conventionally organized schools included in the MITT sample as controls.

The teacher questionnaire of the MITT study included a number of questions taken verbatim from the work of Meyer and Cohen, and it was possible to measure in identical fashion the variables of teacher group influence, individual autonomy, and job satisfaction.[1]

The MITT staff used a different approach to the measurement of task-related interaction (or communication, as we call it) from Meyer and Cohen's, following a sociometric-like procedure. Teachers were asked to name other teachers in the school with whom they discussed classroom (and other) topics and to indicate the frequency with which each discussion occurred. Only reciprocated instances of communication were recorded by our coding procedures. Teachers were given communication scores that reflected both the number and the frequency of their reciprocated nominations--a value we refer to elsewhere as the volume of communication (Packard, et al., 1976, p. 47).

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[1]The MITT staff developed an alternative measure of teacher sense of work autonomy, a 24-item Likert scale. In the replication analysis we have employed the version used by Meyer and Cohen.

Questionnaires were returned by 115 teachers in the unitized schools and 107 in the control schools in the spring of 1974, the first wave of data-taking in the MITT study. Since we intended to use multiple regression procedures in our replication analysis, scores on all of the measured variables were retained in numerical form and treated as interval-level measures.

By and large, the MITT schools were unlike those studied by the Stanford group. Located in widely differing locales from the Mississippi River eastward to the East Coast, the MITT schools were quite heterogeneous with respect to the communities they served, ranging from rural communities of the Border States to central-city neighborhoods of New England towns.

In terms of formal structure, the unitized schools of the MITT study were more sharply differentiated from conventional schools than were the open schools of the Meyer and Cohen study. In particular, all or most of the MITT unitized schools had adopted the so-called Multiunit Model of staff organization, including formal unit leaders, established times for unit meetings, and in some cases an administrative cabinet (consisting of the principal and unit leaders) to work out cross-unit educational policies. We understand that the open schools studied by Meyer and Cohen typically did not have formally designated team leaders.

On the other hand, only three of the seven unitized schools in the MITT replication were of an open-architecture design, whereas open space was a selection criterion for the Meyer and Cohen study. We will have a comment on this distinction later.

Findings

Turning first to the simple comparison of unitized and nonunitized schools, the MITT data reveal two differences from the Meyer and Cohen study. The zero-order correlations between school type and the measured variables shown below indicate that unitized teachers were lower than teachers in control schools in individual autonomy and in job satisfaction, although the latter correlation, based on 230 cases, is marginally significant at the .05 level.

Table 1

	r
Volume of communication	.46
Teacher group influence	.16
Autonomy	-.26
Job career satisfaction	-.13

In comparing these coefficients with the Lambda's reported for the Meyer and Cohen study, one must keep in mind that the absolute values of Lambda and r cannot be equated. The negative relationship between school type and autonomy is consistent with original expectations for the Meyer and Cohen study but inconsistent with their empirical findings.

In specifying the model to be tested through path analysis, it was necessary to add three exogenous variables to the key one of school type. One of the exogenous variables, school size (in number of reporting teachers), was required by our measure of communication. A teacher's communication score

is a function, in part, of the number of other teachers in the school available for communication, and since unitized schools tended to be larger than nonunitized schools, it was important to "regress out" the potential artifact. Meyer and Cohen's measure of task-related interaction did not have this problem.

We also found that teachers in unitized and nonunitized schools differed in two personal attributes that were likely to be associated with endogenous variables of the model. Teachers in unitized schools tended to have less teaching experience and greater professional ambition than those in nonunitized schools.[2] Our examination of the zero-order correlations of these variables with the endogenous variables demonstrated that there were, in fact, significant relationships, so the two were added as exogenous factors. These correlations are shown in Table 2, which also displays the full set of intercorrelations among variables in the model with the exception of those presented previously.

School type, a nominal variable, was effect coded in order that the resulting intercepts and beta weights could be interpreted according to the formulation of classical analysis of variance (Kerlinger and Pedhazur, 1973). For this purpose, unitized schools were assigned the value of 1 and nonunitized schools -1. Log transformations were applied to the communication and job satisfaction scores, since their distributions were markedly skewed.

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[2]The measure of professional ambition is described in Chapter 5 of Meyer and Cohen (1971), from which it was borrowed by the MITT staff. The same bias toward less experienced and more ambitious teachers was present in open schools of the Stanford study as well.

Table 2: Intercorrelations among Exogenous and Endogenous Variables used in MITT Study

	Ambition	School Size	Type of School*	Task-Related Interaction	Teacher Group Influence	Autonomy	Job Career Satisfaction
Years Teaching Experience	0	.04	-.08	-.19	-.07	-.08	.12
Ambition		.09	.14	.14	.15	.08	.09
School Size			.50	.20	.04	-.12	-.06
Task-Related Interaction					.02	-.15	-.12
Teacher Group Influence						.37	.13
Autonomy							.16

*A positive correlation indicates high scores tend to occur in unitized schools.

The Meyer and Cohen model which we tested, including the added exogenous variables, can be expressed by the following equations, here expressed in the form of standardized scores (z_i) with residual terms omitted.

$$z_5 = p_{51}z_1 + p_{52}z_2 + p_{53}z_3 + p_{54}z_4$$

$$z_6 = p_{62}z_2 + p_{64}z_4 + p_{65}z_5$$

$$z_7 = p_{75}z_5 + p_{76}z_6$$

$$z_8 = p_{81}z_1 + p_{82}z_2 + p_{86}z_6 + p_{87}z_7$$

where p_{ij} refers to the value of the path coefficient from j, an independent variable, directly to i, a dependent variable. The subscripts refer to variable numbers 1 to 8, as indicated below and in Figure 2.

1 Years teaching experience

2 Type of school: unitized vs. nonunitized

3 School size

4 Ambition

5 Volume of communication

6 Teacher group influence

7 Autonomy

8 Job career satisfaction

In performing the multiple regression, our practice was to procedurely allow each designated independent variable to enter into the appropriate equation regardless of the size of the proportion of variance it added. Thus, we obtained a path coefficient for each independent variable that appeared in an equation.

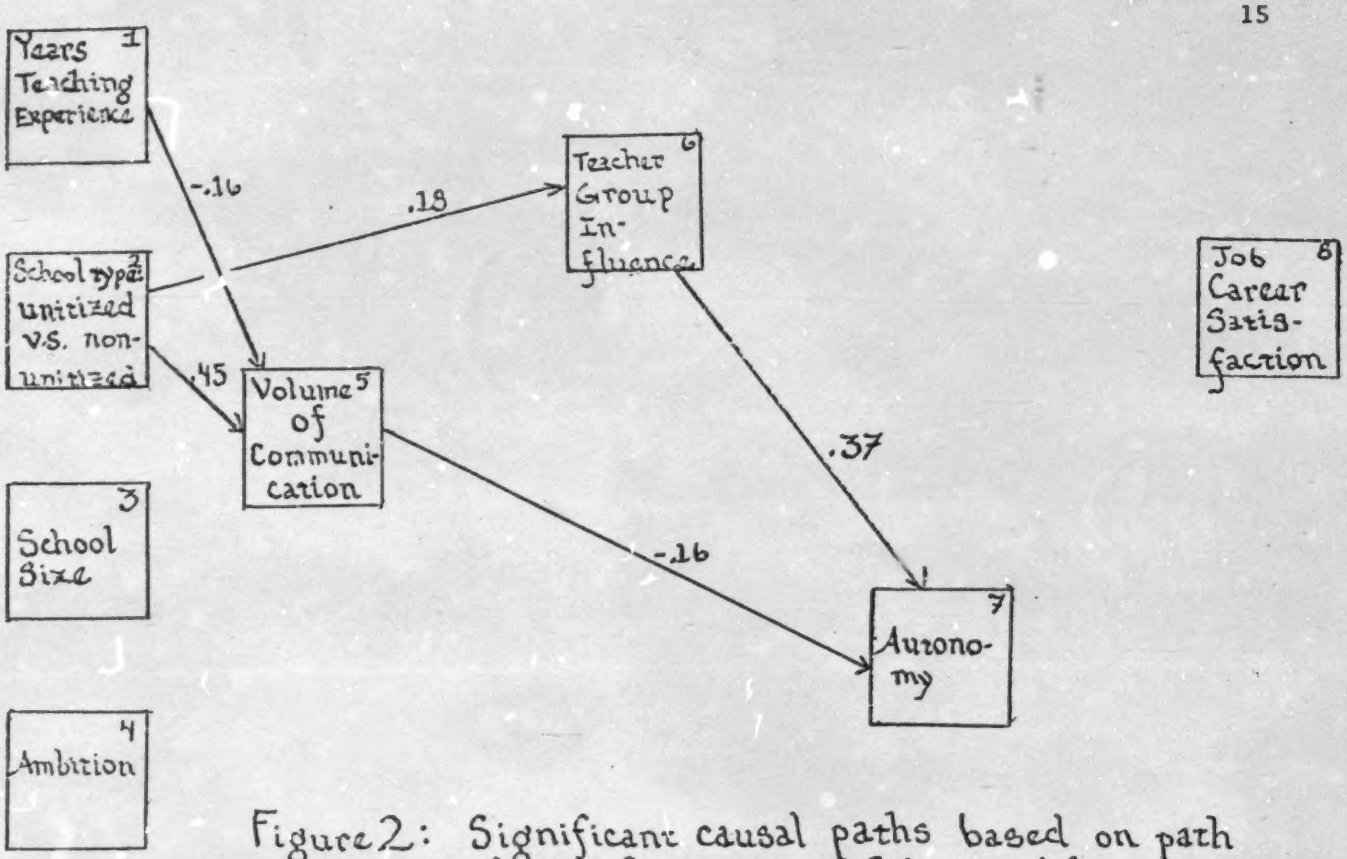

Figure 2: Significant causal paths based on path analysis of Meyer and Cohen model

Table 3: Standardized
Regression Weights for Meyer-Cohen Model
Initially Tested, R^2 Associated with each Regression,
Significance of each Coefficient
(* = Significant at .05 Level)

Dependent Variable	INTERCEPT	1 YRSTCHR	2 SCLTYP	3 SIZE	4 AMBITION	5 COMM	6 TCHGPSC	7 AUTONOMY	R^2
5. Volume of Communication									
p_{5j}		-.1564*	.4497*	-.0288	.0755				.241
6. Teacher Group Influence									
p_{ij} (beta)			.1791*		.1309	-.0765			.047
7. Autonomy									
p_{7j}						-.1595*	.3713*		.161
8. Job Career Satisfaction									
p_{8j}		.1306	-.1088				-.1171	-.1005	.061

Table 3 reports the path coefficients (standardized beta weights) resulting from our test of the causal model with the MITT data. Figure 2 displays the results in diagram form, with statistically insignificant paths eliminated to facilitate inspection.

A key observation supported by these data concerns the determinants of teacher work autonomy. Coefficients of the paths into autonomy from teacher group influence and from classroom-related communication are opposite in sign (p_{76} = .37 and p_{75} = -.16). In the MITT schools, at least, greater control by the collegial group over the boundaries of the work setting seems to enhance individual autonomy, while demands of collaborative teaching (if that is what communication in fact indexes) appear to restrict individual autonomy.

It is interesting, though, that teacher group influence does not grow out of the collaborative teaching situation but rather is a product of school type directly (p_{62} = .18). The path from classroom communication to group influence is not significant. Presumably, this means that collegial control over educational affairs is augmented in unitized schools, regardless of whether teaching is conducted independently in self-contained classrooms or by collaborating teams. We are not sure of the properties of unitized schools that lead to collegial control, but we suspect that they have to do with their formal structure. It is possible that the very formation of units and unit leader positions provides the mechanism for, and legitimizes, teacher input to the policy-making process.

An obvious observation in the path diagram is the absence of relationships between job satisfaction and other variables in the model, endogenous or exogenous. The R^2 value shown in Table 3 indicates that all four variables in our regression equation combined account for only six per cent of the variance in satisfaction, with a personal attribute of teachers (years of teaching experience) contributing the largest share. Neither teacher group influence nor individual autonomy contributed significantly to it, whereas Meyer and Cohen had reported modest relationships in in their data. They did not test for significance, however. Clearly, the variables of the model do not afford a strong purchase on the factors affecting job satisfaction.

In this regard, we were impressed generally by the weakness of relationships among the variables implicated in the model. Few of the simple correlations in the original intercorrelation matrix differ significantly from zero. (With an N of 230, r must exceed .13 for significance at the 5 per cent level.) Nor are the other R^2 values on the right of Table 3 impressive as multiple correlations go. From this standpoint, the model cannot be regarded as an especially powerful one.

We should note, too, that our check on the model's parsimony was disappointing. Following the procedures of Kerlinger and Pedhazur (1973) we attempted to reproduce the original correlation matrix from the computed path coefficients and met with indifferent success.

The MITT and Meyer and Cohen Schools differed in a number of respects, of course, but one difference was especially important in terms of the general line of reasoning of the Stanford group, namely, the architectural design of the school buildings and the implication that held for visibility of the teaching role. The Stanford researchers had selected open schools not only on the basis of the formal organization of teaching units but on the presence of an open-space classroom plan. Only three of the seven unitized schools in the MITT replication study were similarly constructed.

Taking architectural design into account, our efforts to determine whether the relationships among variables of the model would be more closely in accord with the Meyer and Cohen Findings suggested that this factor had little effect on our results. The means of teacher scores on the endogenous variables, for example, were essentially the same in both unitized schools which were open-space and "egg-crate" design. The number of cases in the subdivided sample of schools was too small to support a full-fledged multivariate analysis, so our results must remain tentative.

We were also interested in pursuing the possibility, suggested by one of Meyer and Cohen's analyses, that unitization might advantage only teachers in leadership positions in the schools. One feature of unitized schools in the MITT sample, missing from the open schools of Meyer and Cohen, was the presence of formal unit leader positions, appointive or elective in nature and sometimes with special prerogatives attached. Conceivably, the negligible relationships of independent and dependent variables in the MITT study, especially job satisfaction, were due to the undetected presence of an interaction with leadership position.

We checked this possibility by comparing the scores of team leaders with regular teachers (team members) in the unitized schools on the several endogenous variables. Table 4 reports the simple and adjusted means, including means for teachers in nonunitized schools. The adjustment was made in each case by correcting for the effects of preceding variables used in the regression equation.

These data fail to reveal the differential effects reported by Meyer and Cohen. Both team members and leaders were equally advantaged by unit organization.

Conclusion

This study set out to replicate Meyer and Cohen's cross-sectional investigation of the effects of team teaching using data collected by the MITT Project. Some important causal relationships suggested by the Stanford group were confirmed, notably that extensive work collaboration curtailed the individual teacher's sense of control over his or her own work. However, a number of discrepancies left us questioning the usefulness of the model as general representation of teaming effects on teacher attitudes.

Most particularly, the MITT data indicated that unitization was a multidimensional rather than undimensional variable. Work collaboration did not operate alone to effect an alteration in teacher attitudes. Some aspect of the formal unit structure itself appeared to have come into play. Although we had confidence in many of the causal relationships on a conceptual level, the consistent weakness of the variable relationships lead us to wonder to what extent our findings were the result of random error. The longitudinal data

from the MITT study was designed to confirm or negate this doubt and shed light on the multidimensionality of "unitization" as well.

Table 4: Adjusted and Unadjusted Means for Team Leaders and Members in Unitized Schools and all Teachers in Conventional Schools

	Unadjusted	Adjusted
Volume of Communication		
1. Team leaders	10.5	10.5
2. Team members	10.5	10.4
3. Conventional teachers	8.6	8.7
Teacher Group Influence		
1. Team leaders	3.3	3.2
2. Team members	3.4	3.4
3. Conventional teachers	3.1	3.1
Autonomy		
1. Team leaders	3.7	3.8
2. Team members	3.7	3.7
3. Conventional teachers	3.9	4.0
Job Career Satisfaction		
1. Team leaders	15.4	No
2. Team members	15.7	Adjustment
3. Conventional teachers	16.3	Made

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